Memorandum

Revision Memorandum of Feb. 16, 1955

February 28, 1955

On February 23 a telephone discussion with M.I.M and subsequent discussions with S.M. made it desirable to make certain changes in the plans evolved at the meeting in Boston on February 16 and covered in my memorandum of February 18. Since the distribution of the previous memorandum, no comment other than that referred to above has been received. Thus the description which follows is, to the best of my knowledge, definitive. A star indicates a change from the previous report.

Basic Plan

Sufficient equipment for three operational bases, each with a complement of three* ready aircraft and one spare is to be provided. Each of these bases should be provided with all necessary ground handling, servicing and testing equipment and sufficient storage facilities for 12* sorties. This storage is not considered sufficient to cover all sorties from each base but is looked upon as a terminal for a supply pipe line whose input is adjusted to the activity of the base. In addition, a ready reserve* of one set of configuration "B" and one of "C", packaged for transport, are to be provided.

The configurations are now defined as:

A-1 A unit consisting of a mounting frame supporting:

In Bay 1. A single K-38 camera with 24" lens at f/8 with IMC and rocking drive for one left oblique, vertical and one right oblique, A8-B magazine (2000 ft. 3 mil film).

In Bay 2. A pair of fixed oblique K-17C cameras with 6" Metrogon T lenses at f/8 with precision A9-B magazines (800 ft. of 3 mil film).

In Bay 3. A fixed vertical K-17C camera with 6" Metrogon T lenses at f/8 with precision A9-B magazine (800 ft. of 3 mil film) and programmer and exposure cycling control.

A-2 A unit consisting of a mounting frame supporting:

In Bay 1. A fixed right oblique K-38 camera with 24" lens at f/8 with IMC, A8-B magazine.

In Bay 2. An identical camera fixed left oblique.

In Bay 3. An identical camera fixed vertical, an exposure cycling control and a charting camera.

MH25

B A unit consisting of a camera with 36" f/10 lens, IMC, magazine for 9500 ft.* of 3 mil film for 18x18 inch format, CG anti vibration support, special shutter in non-recoil mount and programmed for 6 oblique positions and vertical; a programmer and exposure cycling control; a mini-vib unit; and a charting camera.

C A unit consisting of a camera with a long focal length optical system, IMC, magazine for 5300 ft. of 3 mil film for 18"x18" format, CG anti vibration support, drive for oblique scan, a mini-vib unit, an automatic exposure control and a charting camera.

This camera will be provided with three modes of operation.*

1. Spotting mode.

In this mode, objects of interest will be selected by the pilot through the periscope. He will be searching and selecting ahead of the lateral plane of the aircraft by 30° to 60°, up to 3 minutes before exposure. He will select an object, set the cross wires upon it and press a button. This action will store the information required to start a burst of pictures when the selected object reaches the lateral plane. Six pictures will be taken in each burst providing 60% overlap in the lateral direction. These exposures will be spaced at a nominal minimum of 1.6 seconds to provide for film transport but might be delayed as much as one additional second each by the mini-vib unit. A minimum interval of 9.6 seconds from the completion of one burst to the start of the next is now contemplated. It does not seem probable that the pilot can discover and set on objects at a rate much in excess of one every 20 seconds.

2. Run Away Mode.

In this mode the camera is fixed in position at an oblique angle equal to the oblique angle of the periscope. If the pilot moves the periscope the camera follows along. Pictures are taken continuously at a maximum rate of one every 3.2 seconds all the while that the control switch is in the "run" position.

3. Alternating Mode.

This mode is like Mode 2 with the exception that the camera is cycled in oblique angle to provide 10% overlap in the lateral plane. Exposures are taken at a maximum rate of one every 1.6 seconds. The coverage along the track is the same as in Mode 2 but the area is wider by a factor of 1.9.

Notes on "C". At 65,000 ft. and 431 knots, each exposure will cover at the nadir a square 5850 ft. on a side. It takes the plane just 3.15 seconds to fly this distance. An overlap of 60% along the flight path then requires an exposure every 3.2 seconds. The basic cycling time of the camera is 1.6 seconds.

Camera load - 5,300 ft. 3,530 exposures

Mode	Hours of Flight	Miles at Nadir: Covered along path	Miles at Nadir: Minimum gap	Miles at Nadir: Width
1	3.27 hrs. min. 588 bursts at 20 seconds	1410	0.78	1.85
2	3.53 hrs. min. 3530 exposures @ 3.6 seconds	1520	-0-	.98
3	1.76 hrs. min. 1765 double exposures @ 3.6 seconds	760	-0-	1.85

Each of these configurations is to be packaged with all necessary tools and installation accessories in a shipping and storage box. The box will contain the bottom for the configuration complete with windows. The box for "C" will contain two bottoms, one for near vertical use and a second for wider oblique coverage.

Base Supply - Photo Equipment

The following table indicates current thinking on equipment distribution.*

Configuration	Aircraft at Base (3 bases) 1	2	3	4 (spare)	Maintenance spares at base	Central Reserve Packaged	Spare Assembled Units not Packaged
A1	x	x	x		x		
A2	x	x	x		x		
B	x				x	x	x
C	x				x	x	x
Charting Camera	x	x	x	x	x	x	
Periscope	x	x	x	x	x	x	

A complete complement of photographic equipment at each base would consist of:

3* boxes containing A-1's with bottoms
3* boxes containing A-2's with bottoms
1 box containing B with bottoms
1 box containing C with two bottoms
1* box containing a spare B and two C bottoms
1 box containing a spare charting camera
1 box containing a spare periscope
1 box containing preflight check out equipment.*
1 maintenance and repair trailer
1 film storage and magazine loading trailer
1 test sample processing and evaluation trailer
1 hoist for installing configurations in aircraft
*Equipment for providing transport and storage of loaded magazines to and from advanced bases.

The tractor for moving trailers and providing power is not included because such a tractor is required to handle and start the aircraft and will be supplied by the aircraft manufacturer. It is assumed that power for preflight checkout equipment and conditioning of loaded magazine storage will be available from transport aircraft used to supply advanced base operation.

The numbers of individual pieces of equipment are as follows:

Item	Number Needed	Spares
K-38 cameras	36*	6 (1)
K-17 cameras	27*	4 (1)
B	3	2 (2) (1)
C	3	2 (2) (1)
Charting Camera (3)	15	5 (1)
Periscope (3)	15	5 (1)

Note (1). Spare lenses and shutters as well as magazines and film spools are still being studied. In the case of 24" lenses, 50 standard lenses are to be reworked and in addition, 50 new lenses are being made. The new lenses will not be available until late in the year (glass is the problem). As the new ones come along, the rework on the existing ones will be cut back. Spares of standard shutters will be provided in large numbers for the expected life will be used up on each mission.

Note (2) The present construction plan for B and C calls for six complete sets of parts plus operating spares. These sets will be assembled as follows:

4 units completely assembled and packaged
1 unit completely assembled, not packaged but held in factory reserve
1 unit held in factory reserve unassembled

Note (3) It is now felt that every aircraft should be equipped with charting camera and periscope, and that if in the case of A-1 the charting camera is not to be carried for reasons of weight it should be removed as a special operation.

Prepared by: _____

CC: Original RMS
Copy #1 RMS
Copy #2 JCB
Copy #3 HIH
Copy #4 AA
Copy #5 EM